

## **AMENDMENTS TO THE CLAIMS**

Please accept amended Claims 2-4, 6, 8, 9, 12 and 13 as follows:

1. (Original) A method of generating a virtual suffix tree (ViST) structure for searching XML documents, comprising:

receiving one or more XML documents;

converting the one or more XML documents into one or more structure-encoded sequences; and

generating the ViST structure comprising:

generating a D-Ancestor index;

generating an S-Ancestor index; and

generating a doc-ID index.

2. (Currently Amended) The method of claim 1, wherein generating a the D-Ancestor index comprises generating a D-Ancestor B+Tree, wherein the D-Ancestor B+Tree indexes one or more (key, data) pairs and wherein the key element is a unique (symbol,path) pair in the one or more structure-encoded sequences, and the data element is a pointer to an S-Ancestor B+Tree.

3. (Currently Amended) The method of claim 1, wherein generating ~~an~~ the S-Ancestor index comprises generating an S-Ancestor B+Tree, wherein the S-Ancestor B+Tree indexes one or more keys, ~~and~~ wherein each of the one or more keys is a pair [begin-ID,end-ID].

4. (Currently Amended) The method of claim 3, wherein ~~generating an~~ the S-Ancestor B+Tree, ~~wherein the S-Ancestor B+Tree indexes one or more keys and wherein each of the one or more~~

~~keys is a pair [begin-ID,end-ID] comprises generating an S-Anccestor index comprises generating an S-Anccestor B+Tree, wherein the S-Anccestor B+Tree indexes one or more keys and wherein each of the one or more keys is a pair (begin-ID,end-ID), wherein IDs of descendent nodes of a node whose label is (begin-ID,end-ID) are in the range of [begin-ID,end-ID].~~

5. (Original) The method of claim 1, wherein generating a doc-ID index comprises generating a doc-ID B+Tree, wherein the doc-ID B+Tree indexes one or more (key,data) pairs and wherein the key element is a node ID, and the data element is a list of XML document IDs.

6. (Currently Amended) A method of answering an XML query, comprising:

receiving an XML query;

transforming the XML query into a structure-encoded sequence;

searching a virtual suffix tree (ViST) structure using the structure-encoded sequence and returning one or more document IDs.

7. (Original) The method of claim 6, wherein searching a ViST structure using the structure encoded sequence, comprises:

(a). assuming the query sequence is  $\langle q_{\text{sub.--1}}, q_{\text{sub.--2}}, \dots, q_n \rangle$ ;

(b) assigning.  $i=1, \text{begin}=0, \text{end}=\text{infinity}$ ;

(c) searching a D-Anccestor B+Tree using key  $q_i$ , which returns an S-Anccestor B+Tree;

and

(d) performing a range search (begin,end) on the S-Anccestor B+Tree, wherein performing the range search comprises:

- (e) returning a set of ranges  $(x_{sub.--1}, y_{sub.--1}), \dots, (x_n, y_n)$ ;
- (f) for each  $(x_i, y_i)$  doing (g) and (h);
- (g) if  $(i=n)$  then performing a range query  $(x_i, y_i)$  on the doc-ID index and returning one or more document IDs;
- (h) if  $(i < n)$  then assigning  $i=i+1$ ;  $begin=x_i$ ,  $end=y_i$ ;  
going to (c).

8. (Currently Amended) A method of dynamically updating ~~the~~ a virtual suffix tree (ViST) structure, comprising:

- receiving a new XML document;
- transforming the XML document into a structure-encoded sequence;
- inserting each element of the sequence into D-Ancessor B+Tree;
- assigning a new label if the step of inserting creates a new node; and
- inserting the new label into ~~the~~ a S-Ancessor B+Tree.

9. (Currently Amended) The method of claim 8, ~~wherein~~ further comprising assigning a new label if the step of inserting creates a new node ~~comprises assigning a new label (x,y) if the step of inserting creates a new node.~~

10. (Original) The method of claim 8, wherein inserting the new label into the S-Ancessor B+Tree comprises inserting the new label (x,y) into the S-Ancessor B+Tree.

11. (Original) A machine-readable medium having instructions stored thereon for execution by a processor to perform a method of generating a virtual suffix tree (ViST) structure for searching XML documents, comprising the steps of:

receiving one or more XML documents;

converting the one or more XML documents into one or more structure-encoded sequences;

generating the ViST structure comprising:

generating a D-Ancestor index;

generating an S-Ancestor index; and

generating a doc-ID index.

12. (Currently Amended) A machine-readable medium having instructions stored thereon for execution by a processor to perform a method answering an XML query, comprising the steps of:

receiving an XML query;

transforming the XML query into a structure-encoded sequence;

searching a virtual suffix tree (ViST) structure using the structure-encoded sequence and returning one or more document IDs.

13. (Currently Amended) A machine-readable medium having instructions stored thereon for execution by a processor to perform a method of dynamically updating ~~the~~ a virtual suffix tree (ViST) structure, comprising the steps of:

receiving a new XML document transforming the XML document into a structure-encoded sequence inserting each element of the sequence into D-Ancestor B+Tree;

assigning a new label if the step of inserting creates a new node; and  
inserting the new label into the a S-Ancessor B+Tree.